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Article

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Cogent Business & Management

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Suggested Citation: Akinwale, Yusuf Opeyemi; Alshraim, Mashael Abdulaziz (2024) : Drivers of innovation capabilities among MSMEs in Saudi Arabia, Cogent Business & Management, ISSN 2331-1975, Taylor & Francis, Abingdon, Vol. 11, Iss. 1, pp. 1-12,
<https://doi.org/10.1080/23311975.2024.2328742>

This Version is available at:

<https://hdl.handle.net/10419/326156>

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To cite this article: Yusuf Opeyemi Akinwale & Mashaël Abdulaziz Alshraim (2024) Drivers of innovation capabilities among MSMEs in Saudi Arabia, Cogent Business & Management, 11:1, 2328742, DOI: [10.1080/23311975.2024.2328742](https://doi.org/10.1080/23311975.2024.2328742)

To link to this article: <https://doi.org/10.1080/23311975.2024.2328742>



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Published online: 13 May 2024.



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Drivers of innovation capabilities among MSMEs in Saudi Arabia

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ABSTRACT

The business environment is increasingly becoming dynamic and unstable as the world is bedeviled with technological, economic, political and social upheavals. The micro, small and medium enterprises (MSMEs) which represent the largest employer of labor are constraint with the new norm of society. It becomes imperative to explore the innovation capability of the enterprises which is one of the important strategies for a firm's growth. Since the Kingdom of Saudi Arabia (KSA) aims to increase the contribution of MSMEs to gross domestic product (GDP) from the current 20%–35% by the year 2030, so the purpose of this research is to evaluate the drivers of innovation capability among MSMEs in Saudi Arabia. The survey was conducted among MSMEs in the Eastern province of Saudi Arabia, and the results using logit regression revealed that in-house research and development (R&D), acquisition of new machinery, training, and size of technical staff have a positive and significant impact in influencing the enterprise innovation capability. Also, the newly established firm was found to have a higher likelihood in driving innovation capability than the old ones. However, external R&D, acquisition of external knowledge, collaboration with other companies and universities and other research institutions are not statistically significant. This study has important managerial implications in improving R&D spending and encourage inter-organizational cooperation among the MSMEs to enhance their innovation capability.

ARTICLE HISTORY

Received 3 June 2023
Revised 23 February 2024
Accepted 1 March 2024

KEYWORDS

Innovation capability; MSMEs; competitive advantage; business environment; Kingdom of Saudi Arabia

REVIEWING EDITOR

Len Tiu Wright, De Montfort University
Faculty of Business and Law, United Kingdom

SUBJECTS

Engineering Management; Development Studies; Economics; Business, Management and Accounting; Information Technology

Introduction

In the last few decades natural resources such as oil, gas and gold have been the most important resources that drive economic growth and development in many countries. Many of those countries that are blessed with such resources seem to benefit greatly from their export earnings derived from the resources as well as the increase in their foreign exchange reserves. Furthermore, large corporations and multinational companies tend to be the major contributors to GDP and employers of labor in those periods. However, the recent trend of economic development has revealed that countries with few or no natural resources have contributed immensely to their national and global growth surpassing many of those that have natural resources. Also, the MSMEs have contributed greatly to both economic growth and employment generation. It generates 99% of employment in the U.S and contributes 44% to GDP (US Small Business Administration, 2019), likewise many developed countries. MSMEs account for approximately 99% of employment in Saudi Arabia's private sector and contributes 28% to the GDP as at 2018 (Akinwale, 2020). One of the targets of the Saudi Vision 2030 in 2016 was to increase the contribution of MSMEs from 20% to 35% by 2030 (Saudi Vision 2030 Document, 2021). This reflects the pivotal position that MSMEs are occupying in the nucleus of socioeconomic development. MSMEs have been recognized as the engine of economic growth in developing countries (Eggers, 2020). It is well documented that technology and innovation have played significant roles in propelling the business and country's economic performance (Akinwale, 2022; Kijkasiwat & Phuensane, 2020; Ma et al., 2019; Malerba, 2005; Pece et al., 2015). Furthermore, innovation entails the system of developing unique methods in

producing goods and services, improve on the existing method and generating new products, market and organizational structure which enable the firm to survive global challenges as well as ensuring sustainable economic development (Mabrouki, 2018).

The business environment is changing rapidly as the tastes and expectations of consumers are being altered by the products and services offered by numerous firms in the market. These services are being brought to the markets by the firms through various novel technology and innovation strategies. This creates strong competition among the firms so as to ensure their continuous existence in the market (Adeyeye et al., 2013; Artz et al., 2010; Canh et al., 2019; Schumpeter, 1961). The capability of MSMEs to innovate becomes important because innovation lends a competitive edge to firms, industries and ultimately, the entire economies (Świadek et al., 2019; Schumpeter, 1975). The increased level of competition globally which affect domestic firms has created a great challenge for the MSMEs to continue to generate a stream of innovations to enable them to maintain a competitive advantage and improve their profitability (Akinwale, 2017; Artz et al., 2010; Reichert & Zawislak, 2014). While technological innovation is an important means to stimulate the economic efficiency of SMEs, non-technological innovation is vital to woo customers and capture more market size by SMEs. More importantly is the ability of a firm to innovate and continuously improve on it so as to ensure sustainability by meeting the demands of the present stakeholders in the business environment without compromising the ability to meet the needs of the future stakeholders (Dyllick & Hockerts, 2002; Shan et al., 2018). The long-term competitiveness of a firm is an output of its innovation capability (IC). Hence, the aim of this study is to evaluate the factors that drive the innovation capabilities of the firm in Saudi Arabia.

Literature review

This study is embedded in the Resource-based view theory which emphasized that the capability and productivity of the firm to favorably compete in the market depend on the resources (both hard and soft) which the firm possesses (Barney, 1991). These resources, otherwise known as knowledge assets of the firm provide the firm with the capability to improve its internal processes and external cooperation which facilitate easier development and acquisition of new skill sets and techniques to operate in a highly competitive landscape. It is well documented that the creation, exploitation and diffusion of knowledge are essential to the economic growth and development of countries; which form the basis of innovation (Adelowo et al., 2017; Asif et al., 2021; Malerba & Nelson, 2011). As a result of an increasing competition in the dynamic business environment, differing empirical studies have been conducted across the globe to explore the factors that could drive a firm's innovation capability.

Zastempowski (2022) explored the determinants of IC among the micro-enterprises in Poland using a survey instrument. The results of the logistic regression revealed the three main factors driving IC of the micro-enterprises namely personal, organization and environmental characteristics. Specifically, the personal characteristics such as experience and skills of the owner of the enterprise, organizational characteristics such as good coordination of cooperation between employees and engagement in initiatives for solving social problems, and external environmental characteristics such as intensive cooperation with research centers and other companies as well as financial support influence significantly influence the firms' capabilities. Ponta et al. (2022) used patents to measure IC, and the outcomes revealed that internal factors such as the technological scope of the company, and external factors such as the family size are critical factors determining the IC of a firm. In the comparative study conducted by Bate et al. (2023) across countries, the results indicated that human capital, R&D activities, innovation linkage and infrastructures are the main determinants of innovation performance and capabilities. Walter et al. (2021) in their study conducted among Portuguese companies found that human capital in R&D has the most significant influence on IC of the companies.

Tariq et al. (2023) in their study conducted among the Thai manufacturing firm showed that green process innovation performance of the firm has a significant influence on the financial risk. Furthermore, competitive intensity reinforced the negative influence of green process innovation on the financial risk of the firm. This indicates that the acquisition and adoption of green process innovation capabilities reduce the financial risk of the Thai manufacturing firm. This stimulates and encourage the manufacturing firms in Thailand to go green. Meanwhile, Majali et al. (2022) conducted a study on green product

innovation and performance among manufacturing SMEs in Jordan, and the results revealed that green product innovation capability has a significant influence on performance at 10% level of significant with green transformation leadership and green entrepreneurship orientation contributing to green product innovation. Also, Le and Lei (2019) conducted a study among 394 staff in 88 Chinese companies and the results showed that transformational leadership and knowledge sharing have positive and significant impacts on the company's innovation capabilities. The perceived organizational support by the employees also serves as a strong mediating factor between knowledge sharing, transformation leadership and innovation capability. In the study of Haider and Kayani (2021) carried out among employees of software firms executing various public and private project on customer knowledge management capability and project performance in Pakistan. The results indicated that customer knowledge management capability directly influence the project performance by significantly reducing the project delay and reduce project cost, which then improve the project performance. More so, it has a stronger indirect effect on project performance through the strategic agility of the firm. Another study (Khan et al., 2021) claimed that business model experimentation, innovativeness and competitive advantage of a firm are the main determinants of the capabilities and performance of SMEs in the market.

Sudolska and Łapińska (2020) in their study among the manufacturing firms in Poland revealed the determinants of IC which include inter- firm cooperation, research and development (R&D) employees and expenditures on R&D by firms. In the review study conducted by Saadi and Che Razak (2019), it was revealed through a framework that R&D and human capital through training and tacit knowledge are significant drivers of organization technology capability. Akinwale et al. (2018) conducted a study on factors affecting innovation capability among Nigerian indigenous oil companies, and the results of the ordered logit regression showed that in-house R&D, worker's job experience, human capital, purchase of advanced machinery and training are significant in driving the IC of indigenous oil companies. In the study of Lendel et al. (2017), it was revealed that internal and external R&D, acquisition of modern machinery and equipment, acquisition and development of computer software, training and external experts' opinions forms the basis of organization innovation capability. Many other studies have also recognized training expenditure, machinery acquisition, patent applications and external knowledge among others (Guan & Ma, 2003; Martinez-Roman & Romero, 2017; Rasiah et al., 2016; Walter et al., 2021; Yang, 2012). It can be observed that various studies have utilized different variables to measure the determinants of innovation capability, and this has produced mixed results from different countries. This study aims to assess the factors that drive innovation capability among the MSMEs in Saudi Arabia. This becomes important as there is hardly any previous study that has examined the drivers of innovation capabilities among SMEs in Saudi Arabia. The result from the study would contribute to the existing literature of innovation capability by bringing forth the drivers of innovation capability in Saudi Arabia.

Methodology

The study utilized a survey adapted from the Community Innovation Survey (CIS) 4 to capture the innovation capability and its drivers among the MSMEs in Saudi Arabia. According to SMEs General Authority 'Monshaat' a firm that possesses 1–249 full time employees is considered to be a micro, small and medium enterprise. The survey was conducted between January and November 2019. Convenience and purposive sampling techniques were firstly adopted to choose the Eastern Province of the country and the firms which fall within the category of MSMEs respectively. Afterwards, random sampling was adopted to get information from the owners or top managers of the SMEs without given any preference to any of the SMEs in particular. The sample size was determined using the Cochran (1963) approach with a 90% confidence level, and the formular generated a total of expected responses of 271. The survey instrument was sent to three experts in the field of innovation to get their feedback on the strength of the questionnaire in measuring the required constructs. Also, a pilot test was conducted in Dammam city with five SMEs so as to improve the structure and the content of the questionnaire, and to facilitate an easier understanding of the questionnaire. The feedbacks from the responses of both the academic experts and owners of the enterprises are incorporated in preparing the final survey instrument which was used for the study. This was done to ascertain the validity and reliability of the survey instrument.

Meanwhile, only 193 responses were collected and analyzed in this research which represent a 71% response rate.

The status of innovation capabilities is evaluated by internal knowledge competence, R&D and external factors, among others. The dependent variable which is the innovation capability at the firm-level is measured by the introduction or improvement of a product and process innovation in the last three years. This is measured on a 5-ordinal scale from 'not at all' to 'very high level'. The independent variables are in-house R&D, external/outsourced R&D, acquisition of new machinery, acquisition of software, acquisition of external knowledge, training, collaboration with other companies, collaboration with universities and other research institutes, age of firm and size of firm (technical staff). The aforementioned independent variables, otherwise known as drivers of innovation capability are also measured in 5 ordinal scale from 'not at all' to 'very high' level of implementing any of these activities in the last three years in the firm. The result is analyzed using descriptive (frequencies, charts) and logistic regression. The logistic regression is adopted as it has been adjudged as an adequate tool in analyzing a model whose dependent variable is in ordinal scale form (Brooks, 2019). This has been well explained in some research articles and textbooks (Brooks, 2019; Zastempowski, 2022).

Results and discussion

Descriptive analysis of the enterprises is presented in Table 1. The nature of the enterprises was quizzed from the respondents and approximately half (56.5%) of the samples reported their businesses to be Sole Proprietorships, followed by 23.8% Private Limited and 19.7% Partnership. The Table also shows that the majority (83%) of the enterprises are within micro and small while 17% of the sample are medium sized. Furthermore, the respondents were asked regarding the percentage of technical and managerial staff among the total employees, and Table 1 revealed that 40% of the enterprises have less than 10% of their employee as technical and managerial staff, whereas 26% of the enterprises have technical and managerial staff above 50%. This signifies that the majority of the enterprises' members of staff are not technical nor holds a managerial role. This shows that most of the enterprises have few technical and many support staff. The business activity that the sampled enterprise engage in differs from one another as the majority of them operate in the service sector (37.8%) and the trading sector (31.6%). While 13.5% of the enterprises engage in manufacturing business, 6.7% in real estate business, 0.5% engage in

Table 1. Information about the enterprise.

Enterprise Data	Description	Frequency	Percentage
Nature of the Enterprise	Private Limited	46	23.8
	Partnership	38	19.7
	Sole Proprietorship	109	56.5
	Total	193	100
Size of Business	Micro	78	40.4
	Small	82	42.5
	Medium	33	17.1
	Total	193	100
Size of Technical and Managerial Staff	Less than 10%	76	39.6
	10% - 20%	44	22.9
	21% - 50%	22	11.5
	51% - 80%	25	13
	More than 80%	25	13
	Total	192	100
Kind of Business	Manufacturing	26	13.5
	Real Estate	13	6.7
	Service	73	37.8
	Trading	61	31.6
	Agriculture	1	0.5
	Other	19	9.8
	Total	193	100
Age of the Enterprise	Less than 2	44	22.8
	2-5	36	18.7
	5-10	32	16.6
	10-20	36	18.7
	More than 20	45	23.3
	Total	193	100

Source: Authors' Analysis.

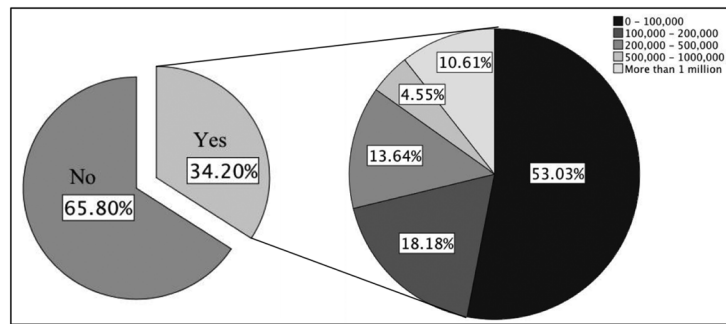


Figure 1. SMEs special funds for R&D and the range of R&D funds. Source: Authors' Analysis.

agriculture and 9.8% engage in other kinds of business such as constructions and hospitality. Table 1 also shows the number of years the enterprise started operation which measure the age of the firm. Approximately 23% of the sampled SMEs have been established over twenty years ago, making the total of the enterprises which have been established for more than five years to be approximately 60%, while 40% are those established less than five years.

The research instrument also enquired from the respondents on the existence of special fund for R&D in their firms. The results as revealed in Figure 1 shows that 34.2% of the enterprises have special R&D funds while 65.8% of them do not hold any special funds for research and development (R&D). Among those that allocated special funds to R&D, 53% stated that they assigned less than SAR 100,000 (local currency) to R&D funds, followed by 18% which assigned between SAR 100,000 and SAR 200,000 to R&D funds. Furthermore, 13.6% of SMEs allocated between SAR 200,000 and SAR 500,000 as funds for R&D; 10.6% of SMEs devoted more than one million as R&D funds while the lowest number of SMEs (4.6%) apportioned between SAR 500,000 and SAR 1,000,000 to R&D funding. This implied that few of the MSMEs devoted large amount of fund for R&D. Many studies have shown that SMEs allocated a small proportion for R&D due to their sizes (Choi & Lee, 2018; Nakajo, 1995), and some other studies claimed that conducting research is actually easier for SMEs than larger firms because of the less bureaucracy in the SME due to the small size and structure (Park, 2011).

Table 2 reveals the correlation between the innovation capability and the proposed determining factors. The outcomes highlight that all the factors are positively related to the firm's innovation capability except the age of the enterprise which has a negative correlation of -0.15. Meanwhile, the factors and their coefficient values according to their strength of correlation with innovation capability are state thus, training (0.56), inhouse R&D (0.51), acquisition of machinery (0.46), external/outsourced R&D (0.43), acquisition of software (0.38), collaboration with other companies (0.33), acquisition of other external knowledge (0.31), collaboration with universities (0.23) and size of technical staff (0.09). Moreso, all the factors have a significant relationship with innovation capability except the size of technical staff which is not significant in addition to its low correlation value.

Table 3 below shows the factors influencing the innovation capability of the MSMEs. The ordered logistic regression analysis was used to test the hypotheses where the innovation capability is the dependent variable, and the explanatory variables that are expected to have a high influence on innovation capability within the enterprise. The results of the ordered logistic regression, the coefficient of each variable, the *p*-value, and the odd ratio are presented in Table 3. Cronbach's alpha test was used to determine the factors' reliability, and each of the factors has a value of 0.7 or more which indicate that all variables are reliable. The coefficient is positive in all variables except for the *Acquisition of software*, *Collaboration with Universities and Other Research institution*, and *Age of Firm* which have negative coefficient values. Accordingly, the odd ratio of all variables is above 1 except for *Acquisition of software*, *Collaboration with Universities and Other Research institution*, and *Age of Enterprise* which are less than one. Based on the test outcomes, these results confirm that all variables have a great likelihood to influence the innovation capability except the three factors aforementioned. This implied that most of the sampled MSMEs did not invest enough in the acquisition of software to improve their capabilities neither do they collaborate with universities. The level of collaboration with universities could be said to be very low which usually accounts for low innovation capability in some MSMEs, and this is in line with few studies

Table 2. Correlation matrix of the enterprise innovation capability and its drivers.

No	Variables	1	2	3	4	5	6	7	8	9	10	11
1	Innovation Capability	1	–	–	–	–	–	–				
2	Size of technical staff	0.09	1	–	–	–	–	–				
3	Age of Enterprise	–0.15*	0.79	1	–	–	–	–				
4	Inhouse R&D	0.51**	0.17*	0.08	1	–	–	–				
5	Outsourced/ External R&D	0.43**	.19*	0.05	0.58**	1	–	–				
6	Acquisition of Machinery	0.46**	0.01	0.09	0.64**	0.54**	1	–				
7	Acquisition of Software	0.38**	0.05	0.10	0.50**	0.54**	0.59**	1				
8	Acquisition of External Knowledge	0.39**	0.04	0.07	0.36**	0.49**	0.36**	0.42**	1			
9	Training	0.56**	0.21*	–0.04	0.63**	0.52**	0.48**	0.52**	0.39**			
10	Collaboration with companies	0.33**	–0.0	0.01	0.41**	0.42**	0.39**	0.33**	0.33**	0.46**	1	
11	Collaboration with universities	0.23**	0.08	–0.09	0.30**	0.45**	0.22**	0.24**	0.42**	0.34**	0.46**	1

*Significant at the 5% level (2-tailed).

**Significant at the 1% level (2-tailed).

Source: Authors' Analysis.

Table 3. Ordered logistic regression results.

Variables	B coefficient	p- value	Odd- ratio	Cronbach alpha	Decision
H ₁ : In-house R&D	0.3898	0.033	1.476	0.77	Accept
H ₂ : External R&D	0.1757	0.939	1.192	0.77	Reject
H ₃ : Acquisition of new machinery	0.1348	0.043	1.144	0.78	Accept
H ₄ : Acquisition of software	–0.0003	0.993	0.999	0.78	Reject
H ₅ : Acquisition of external Knowledge	0.4522	0.518	1.571	0.79	Reject
H ₆ : Training	0.8564	0.020	2.354	0.79	Accept
H ₇ : Collaboration with other companies	0.2129	0.342	1.237	0.79	Reject
H ₈ : Collaboration with Universities and Other Research institution	–0.7263	0.167	0.483	0.80	Reject
H ₉ : Age of Firm	–0.7257	0.001	0.483	0.82	Reject
H ₁₀ : Size of firm (technical staff)	0.6223	0.001	1.863	0.81	Accept

Source: Authors' Analysis.

(Adeyeye et al., 2013; Zastempowski, 2022). The significant influence of these factors on the enterprise's innovation capability is also observed. Among the factors observed, in-house R&D, acquisition of new machinery, training, and size of technical staff have a positive and significant influence on the enterprise innovation capability at 5% level of significant, while the age of the enterprise has a negative and significant influence on the enterprise innovation capability. However, other factors such as external R&D, acquisition of external knowledge, collaboration with other companies and collaboration with universities and other research institutions have positive but insignificant influence on the enterprise innovation capability. Hence, Hypotheses 1, 3, 6 and 10 are accepted as they exhibit positive and significant influence on innovation capability.

The macroeconomic environment dynamism which is affecting the microeconomic agents and organizations continuously disrupting the business environment, hence creating a new norm in the business world. This entails creating a resilient and dynamic structure which could accommodate the resulting strategy since firms are forced to be innovative in their business development. In the current dispensation, innovation has been identified by business and academic professionals as a way to gain a competitive advantage by which many companies consistently outperform their competitors (Barney, 1991). Innovation is generally viewed as a pinnacle success factor in an extremely competitive and

international economy (Rajapathirana & Hui, 2018). The resources and the capabilities of an organization as reflected in the resource-based view of the firm is seen as important factors which keep an organization competitive in situations of economic turbulence and a hyper-competitive landscape. An organization would not only need its internal resources to sustain this situation, but also the external relationships and collaborations with other stakeholders in the value-chain (Zygmunt, 2019). Some researchers have acknowledged inter-organization cooperation among the firms in the area of pooling resources and mutual engagement in R&D activities as an important avenue to develop innovation capabilities which could sustain them in the increasingly complex business environment (Chiang & Hung, 2010).

The outcome of this study reflects that an average of 3 out of 10 MSMEs have a special fund dedicated to R&D among the sampled enterprises, and the majority of the funds are less than SAR 200,000 (local currency, equivalent to approximately USD 53,000). This is similar to the related study (Choi & Lee, 2018) which found that SMEs usually devote less fund to R&D as a result of their limited access to fund. In-house R&D which constitutes the efforts in developing research activities within the firm is found to have a positive and significant impact in developing the enterprise innovation capability. This has also been recognized by various studies as a strong base of developing internal innovation capability (Adeyeye et al., 2013; Ayari, 2013; Cima et al., 2018; Castellani et al., 2016). Although this study found that external R&D to be positive but not significant in influencing the enterprise innovation capability. This could reflect that the level of outsourced R&D which the firm purchased from other firms or allow other firm to perform on its behalf is low. This could be attributed to the low special fund allocated to R&D by the firm (Martínez-Román et al., 2011). The result is not in conformity with that of related studies (Ayari, 2013; Sudolska & Łapińska, 2020). The new machinery acquired by the firm positively and significantly influence the innovation capability of the enterprise. The new and sophisticated machinery acquired by the firm has been acknowledged to facilitate the innovation capability as it enhances the process of production and reduce the cost of production. Furthermore, the training of employees and size of the firm (technical staff) are positive and significant in driving innovation capability (Saadi & Che Razak, 2019). The knowledge (both hard and soft skills) acquired by the employee of the enterprise as well as the larger number of technical staff put a firm in a better situation to acquire, assimilate, adapt and deploy new methods and processes which further strengthen the capability and competitive advantage of the firm (Adelowo et al., 2017; Cohen & Levinthal, 1990; Samson et al., 2017). Moreso, the result indicate that newly established enterprises have a great tendency of driving innovation capability as against our expectations. This could be as a result of the fact that the old enterprises might be used to the ways they operate their business and not ready to easily change their usual way of doing things unlike the new enterprise which is entering the market with innovative and creative ideas in order to penetrate the market. However, none of the inter-organizational cooperation factors (such as acquisition of external knowledge, collaboration with other companies, universities and research institutes) which foster the open innovation capability of the firm is statistically significant. This is not in line with few related studies (Löf & Broström, 2008; Zastempowski, 2022; Zhang & Merchant, 2020; Zygmunt, 2019). This indicates that there is a lack of exposure of the micro, small and medium enterprises to the importance and benefits of inter-organizational cooperation between them and other external stakeholders such as other companies and universities. The drivers of innovation capabilities among the enterprises, especially among the MSMEs is less researched in Saudi Arabia despite its level of importance to the survival and growth of the firm. The outcomes of this study contribute to knowledge as a result of the scanty existing literature in Saudi Arabia, and it has some vital managerial and policy implications in the country.

The managerial implications of this study include the importance of increased spending of MSMEs on R&D as this contributes significantly in driving the innovation capability of the enterprises. Small enterprises should not perceive spending on research as a waste but rather a good support system which is vital to their capability and their business growth. Moreso, there is a need for the MSMEs to employ technical staff as well as continuous training of their employees so as to improve their skill sets which is crucial to the development of the firm's innovation capability. This creates a resilient and dynamic capability system which is difficult to wither during macroeconomic turbulence or strong competition. Also, being a new firm in the industry does not prevent such firm to develop innovation capability as

some of the newly established firms are as strong or even stronger than the old ones because they come up with creative and innovative ideas and skill sets given them competitive advantage. Also, it is crucial for the MSMEs to collaborate with other companies and universities so as to improve their efficiency and develop new innovative ideas which could reduce their costs and improve their efficiency level. Collaboration with other stakeholders is very important in building innovation capability as a single enterprise may not have all the resources needed to meet the needs of existing and potential customers. On the part of the policy makers, the government could facilitate the MSMEs in accessing low-cost finance from the financial institutions to support their R&D and acquire sophisticated machinery/software, give special financial packages to the micro and small enterprises as well as creating an enabling environment which foster cooperation between the enterprise and the universities/research institutions.

Conclusion

It has been established by differing studies that SMEs play a vital role in countries' economy, as they are driving forces that provide job opportunities to the teeming population, contribute to the country's GDP, and help in wealth creation. The survival and continuous growth of these enterprises becomes paramount to the sustainable development of a nation. Since increasing the contribution of SMEs to the national GDP is one of the core visions in Saudi Vision 2030, and developing innovation capability is pivotal to the firm performance. Hence, this study assesses the drivers of innovation capability among the micro, small and medium enterprises in Saudi Arabia. The outcomes indicate that 3 out of every 10 firms have special R&D fund, but in-house R&D still remain positive and significant in driving the enterprise innovation capability. Furthermore, the purchase of new machinery, training of employees and number of technical staff of the enterprise (size of firm) have positive and significant influence in driving innovation capability of the enterprise. It is imperative for the enterprise to improve the skills of their employees and possess the up-to-date machinery as these would facilitate the production efficiency of the enterprise. Furthermore, the newly established enterprises tend to have higher tendency of improving their innovation capability as they are relatively flexible in adapting to the industrial changes. The inter-organizational cooperation of the sampled enterprises such as collaboration with other companies and universities are not significant in driving their innovation capability. This could be attributed to the poor level of collaborations with external stakeholders of the enterprises. There is a need for the MSMEs to collaborate with one another as well as with the universities to improve their innovation capability as it is difficult for a single enterprise to possess all the capabilities required to satisfy the needs of the customers. Therefore, this study suggests that MSMEs should invest more in their internal and external resources which include R&D, relevant machinery and software, training of employees and external collaborations. The limitation of the study includes the constraint of innovation capability to only technological innovation (process and product). Further study could consider both technological and non-technological innovation. Moreso, future research in this area could obtain more sample size by considering all the regions of Saudi Arabia.

Disclosure statement

No potential conflict of interest was reported by the author(s).

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Data availability statement

Data available on request from the authors.

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